

APPARATUS AND METHOD FOR INITIATING A COMBUSTION
REACTION WITH SOLID STATE SOLID FUEL

CROSS REFERENCE TO RELATED APPLICATIONS

5 **[0001]** This application is related to copending United States Patent
Application No. 10/007,994, titled Apparatus And Method For Initiating A
Combustion Reaction With Slurry Fuel, filed on November 8, 2001.

FIELD

10 **[0002]** The present disclosure relates to fuel ignition and, more
specifically, to optically initiated chemical reactions to establish combustion in a
propulsion engine using storable high-density solid state solid fuels.

BACKGROUND

15 **[0003]** Solid state solid fuels are propulsion fuels that are in solid form
when stored at ambient temperatures. As with most any material that is in a solid
phase, the mass density and energy density of the fuel is much high in the solid
state than when in a liquid or gas phase. As a result, the specific impulse and thrust
potential from the fuel is much higher in solid state solid fuels, herein also referred to
20 as solid fuels. However, fuels are more difficult to ignite using traditional electric
spark or torch-ignition techniques when in a solid state than when in a liquid or gas
form.

[0004] Therefore, it would be highly desirable to provide an efficient
and sufficiently simple method of initiating a combustive reaction in a solid fuel.

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SUMMARY

[0005] In various implementations, the present disclosure provides a
method for initiating and sustaining a combustive reaction in a solid fuel. The
method includes generating at least one pulsed optical signal and directing the
30 pulsed optical signal to a plurality of ignition points within at least one combustion

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OKay to enter.